Testimony of Rhone Resch, President, Solar Energy Industries Association (SEIA)

Before the United States House of Representatives Committee on Energy and Commerce, Energy and Air Quality Subcommittee

Wednesday, February 16, 2005 - Summary

Current Status of Solar – There are three major solar technologies - Photovoltaic (PV) panels convert sunlight directly to electricity. This industry has grown by a factor of 10 since 1996 alone, and now involves GE, Sharp, Sanyo, Shell, BP, and Kyocera, among others. Solar water heating (SWH) offers additional potential, especially for homes. Many nations obtain thousands of megawatts of energy from SWH. More than 350 megawatts in the American Southwest comes from central station bulk Concentrating Solar Power (CSP,) where fields of mirrors generate heat for a steam turbine.

Solar is Part of the Solution to the Gas Crisis - High and volatile gas prices are dragging down the economy. Solar can relieve these tight markets by reducing demand during midday "peaks", when the most expensive, least efficient generation is used. Solar could displace the equivalent of new LNG capacity needed in the next 10 years, with price effects worth billions on the very tight spot market.

Solar Power is Domestic, Affordable, and Reliable – From Maine to Nevada, the US enjoys the best solar resource in the industrialized world. Retail solar generation, less expensive than ever before, also requires no fuel - customers enjoy fixed energy costs for 20 years plus. Solar reduces the multi-billion dollar annual impact of grid failures by relieving peak demand at key failure points, and reducing infrastructure requirements.

Economic Benefits of Solar –The PV industry alone is worth more than $6 billion, growing annually at 40%. The majority of this growth is in Germany and Japan, but if the US were to catch up, it would generate more than 40,000 new jobs – on all 50 states - over the next ten years.

The Challenge– We must commit to long-term policies that remove barriers and create incentives. The current patchwork state-by-state small generator interconnection rules must be replaced by a single procedure. The current incentive proposed in HR6 should be improved - PV incentives should be less than half of system cost, be available for a meaningful period of time, and decline every year. We propose $3 per Watt for small systems, $2 for larger, with each declining by 5% per year, and smaller SWH incentives. The Energy Star program should be opened to SWH devices, and CSP should be permitted to use the wind PTC without additional restriction.

If these policies are enacted, energy payments that might have gone overseas will instead provide more than 60,000 new jobs in all 50 states, and save more than $64 billion in gas costs over 20 years. If they are not, the industry may slowly move almost entirely overseas, leaving us to import yet another technology and energy source.

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Thank you, Mr. Chairman and members of the Committee, for giving me the opportunity to testify today. My name is Rhone Resch, and I am president of the Solar Energy Industries Association (SEIA). SEIA is the national trade association of the solar industry, representing all solar technologies and more than 20,000 employees in all sectors from manufacturing to installation. We are located in Washington, but work closely with state and regional chapters throughout the U.S.

Current Status of Solar Energy

The solar industry is comprised of three technologies, all of which are experiencing substantial global growth.

Photovoltaics (PV) are a domestically developed technology that uses silicon semiconductors to covert sunlight directly to electricity. PV cells are used both on and off grid to provide high-value retail electricity. This industry has a 40% annual global growth rate, driven by booming markets in Japan and Germany. In 1996, the global industry made 100 megawatts of panels – less than a billion dollars' worth. In 2004, almost 1100 megawatts came out of the factory doors, worth at least $6 billion. This growth has not gone unnoticed, and in the last few years some of the worlds largest electronics and energy companies have entered into the PV industry, including, among others GE, Sharp, Sanyo, Shell, BP, and Kyocera.

We also represent the solar water heating industry. Solar water heating uses panels that gather energy from the sun to heat the water in your hot water tank or radiant heating system. Simple installations can reduce home natural gas usage by up to 70% – even in freezing climates. Israel, for example, derives thousands of megawatt-hours of energy from these rooftop devices.

Our largest-scale technology is Concentrating Solar Power (CSP) These Southwestern power plants consist of large focusing mirrors, which provide heat for steam generators in a conventional power plant. Natural gas hybridization or thermal

storage can make these into on-demand, dispatchable power plants. There are more than 350 megawatts of this technology operating today, 100 plus of which were purchased by Florida Power and Light just two weeks ago.

These technologies all have their own attributes and virtues, but I would like to take them as a whole, and focus my discussion today around three primary points:

1. We have a natural gas crisis and solar must be part of the solution
2. Solar energy is domestic, reliable and secure
3. The true value of solar energy is many times greater than its cost

Natural Gas Demand and the Role of Solar Energy

All of you who opened up your January natural gas bill two weeks ago have felt the impact of the natural gas crisis. Although the U.S. produces more natural gas than any other country outside of Russia, we still have the highest and most volatile prices in the world. The current nationwide average is $7.25/Mcf , with peak prices exceeding $30/Mcf last month in New York and New England. We have seen two back-to-back days in these markets where the price increased by more than 100%. Natural gas is a critical part of our energy infrastructure and will remain so for a long time, but these high prices and significant volatility are having a significant economic impact on our country that we must address. Federal Reserve Board Chairman Alan Greenspan has repeatedly cited high energy costs as a major drag on the economy. Compared to 5 years ago, natural gas is costing us an extra $100 billion per year.

No one technology can solve this problem - but solar is better suited than most to displace natural gas demand and relieve some of the tightness in the market. During peak load periods, utilities use natural gas-fired peaking or intermediate plants to provide the additional electricity needed by consumers. Most of these plants are very inefficient, requiring 3-4 times more natural gas per kWh than baseload plants. The peak load periods that require the use of these plants generally occur from 10 AM until 5 PM, with the greatest usage coming on hot days. Solar electricity generation directly correlates directly with this peak (see attachment 1). This means that increased use of solar can directly displace one of the most inefficient uses of natural gas.

We recently unveiled a report entitled, “Our Solar Power Future: The U.S. Photovoltaic Industry Roadmap for 2030 and beyond”. According to this report, photovoltaics alone can displace over 6 trillion cubic feet of natural gas in the next 20 years - more than will be produced in the Gulf of Mexico this year. By way of further context, increased use of photovoltaics could eliminate the equivalent of our need for new imported LNG within 10 years (see attachment 2). Practically speaking, this is a small amount, but it will have a meaningful effect. Since so much of the trading price depends on movements in this peaking spot market, the overall impact could be significant - we estimate that removing this demand will save nearly $64 billion.

A Secure, Dependable Energy Supply

Lowering the rate of energy imports ties directly into our second benefit of solar energy, which is to strengthen America’s energy security by providing energy that is domestically controlled, affordable and reliable.

Let me first emphasize that solar energy is 100% domestic, and that the U.S. has the best resources in the industrialized world. This continuous, free source comes down nationwide, in every community and congressional district. A solar system in New York generates 80% of the output of one in LA (see attachment 3) – and that retail electricity would have a nearly equivalent value in that more expensive state. Using only correctly oriented, unshaded, available roofs, we could produce 500,000 megawatts of solar energy without siting a single power plant.

Security also comes in the form of economic stability. Energy costs represent a higher portion of our monthly expenses than ever before, and each month they continue to rise. Solar is a reliable source of electricity with no threat of interruption, shortage, or price swings. Once a system is installed, there are no fuel costs and minimal maintenance costs. You do not have to compete with coal or gas-fired wholesale generation at 2 or 4 cents per kWh, but rather with the 10 or 14 cents you pay at the meter. When you put a system in today, you know what your electric bills will be in 2030 – no matter what happens to OPEC, no matter how much LNG capacity is built, no matter what happens to the grid, or to climate policy. This has particular import for the growing percentage of our aging population living on fixed incomes.

Finally, a reliable energy source is a secure energy source. Although utilities do a great job maintaining transmission and distribution systems, problems do occur – we experience expensive blackouts every year. By directly displacing peak demand, solar reduces wear and tear on the grid, increases reliability, and decreases requirements for costly infrastructure. Sitting atop your roof, and providing electricity directly into your home, solar is a smart, distributed resource that does not increase our vulnerability to attack or disaster at the limited number of crucial grid points. Considering that power outages and disturbances cost the U.S. economy $119 billion per year, there is a strong case for secure, dependable and distributed sources of energy that bypass single large points of failure.

Economic Benefits of Solar

As of today, the global PV industry is worth $6 billion a year, and growing at 40% annually. Unfortunately, the vast majority of growth in this domestically invented industry is now occurring overseas. Formerly the unquestioned leader in PV manufacturing, the U.S. lost its lead in 1997, and now represents only 10% of production. Meanwhile, through the creation of strong incentives, Germany and Japan have cultivated thriving industries, supporting tens of thousands of quality jobs in engineering, manufacturing and construction. The good news is that the global market is growing rapidly and with support from the federal government, the U.S. can still create a solar market that dominates the rest of the world.

If the U.S. were to experience the growth seen in recent years in Japan and Germany, or even in individual US states, the economic rewards would be great. Every megawatt of solar installed currently supports approximately 32 jobs – 24 in high-tech manufacturing, and 8 in local design, installation and service - created right where the systems are installed. Communities that choose solar – and most in the US could – create jobs at home, rather than having their purchases create them elsewhere.

The Renewable Energy Policy Project recently released a study in which they quantify the economic benefits of the PV Roadmap state-by-state. They looked at the PV panel – the steel, glass, wires and silicon that make it up – and examined where those parts could be manufactured and how many people each would employ. They

found that with appropriate policies, the U.S. industry would create more than 40,000 new jobs, in all 50 states, over the next 10 years – and 230,00 in the next 20 (see attachment 4).

The solar energy industry is growing rapidly, and the U.S. has a choice: Do we seize this opportunity to secure tens of thousands of domestic jobs and send billions of dollars to US factories, or do we sit on our hands while the Germans and Japanese exploit the next great high-tech industry?

The Challenge for the U.S.

In the early 1980s, the U.S. built a commanding advantage in the solar industry thanks to innovation and pioneering research. In the past eight years, we have lost this edge. Today, the U.S. has a market share near 10%, down from 41% in 1997. Installations in Germany increased by 170% in 2004, while U.S. installations increased by just 25%. Germany certainly does not come to mind as the country one would go to for sunny weather. Yet the governments of Germany and Japan are strongly committed to developing their commercial markets. There is a familiar historical parallel here with other high-tech industries — and we must consider that in this case our energy security is at stake as well as our economic security.

If the U.S. is to share in this continuing boom, we must have a long-term, sustainable policy – one that promotes economic development, protects our environment, and strengthens America's energy security.

Remove Market Barriers

The first problem we need to solve is a procedural barrier that keeps solar energy from accessing the electricity market. As it stands, it is effectively impossible in many states to put a solar electric system on your house. The interconnection standards are either too vague or too much oriented to big, central station power plants. A typical home solar system – approximately 2 kilowatts – produces the equivalent of two microwaves oven's worth of electricity at any one point in time. If you're not home to use it, it will feed back into the grid and be sold at retail price to the next "downstream" customer.

The IEEE and the UL have developed standards for how a homeowner can connect their solar systems while protecting other customers, the grid, and the workers that support it. Many states – New Jersey, New York, California, the PJM, and many others, have adapted those into a set of procedures that make sense. The National Association of Regulatory Utility Commissioners and the FERC have come out with very similar models.

Nevertheless, there are still many utilities out there that will treat you as a major generator of electricity, charging you $10,000 to conduct a study about how your 2 kW will affect the grid. Some, more directly, will deny you a connection outright. We have to comply with dozens of different standards nationwide. Solar prices – and those of all distributed generation, from fuel cells to small wind turbines - are artificially inflated by this patchwork, which requires the industry to custom design, test and certify a system for each new state or utility requirement. It is as if you needed a 50-state adapter pack with each new telephone. This regulatory redundancy is choking the industry, and we need a single, nationwide procedure.

We also face a problem of public awareness and trust that we could address at very little cost. One of the best things the government could do to increase public knowledge of, and trust in, quality solar devices, would be to open the Energy Star performance and quality certification program to solar heating. For very little cost, this would increase the public's recognition of solar water heating and create visibility and distribution channels would not exist otherwise.

Of course, at the end of the day, Germany and Japan are cornering the market because they have created incentives and the U.S. has not – remember, in the U.S. today there are no federal incentives to build solar systems on your home. The current tax code gives a 10% credit for commercial solar, and HR6 as it stands would create a 15% residential credit. When we saw that credit, it spurred us to examine the industry, to look at other models, and to see what would really be needed to catch up to the rest of the world.

Create Tax Incentives that Jumpstart the Market

We found that there are several principles that must exist for market incentives to result in self-sustaining markets and economic growth.

First, the incentive should be authorized for at least five years at a time, so that companies can confidently make investments in expanded capacity. Credits that turn on and off every year don't do anyone any favors.

Second, the incentive should pay for half – or less – of a system, so that the customer has to make their money back through years of high-quality performance, and has an incentive to purchase modern, warranteed, reputable equipment.

Third, the incentive should *decline every year, and eventually expire.* Our costs are down by more than 95% since the late 90s, and we expect them to continue to drop by 5% or more annually for the foreseeable future; the credit should encourage, rather than obstruct, this progress. We also want to avoid long-term dependency, so the incentive should be designed to expire. The other effect we've seen in other nations that have successfully used this model is that a declining incentive moves sales; people who were "on the fence" about their decision to purchase, go into the market immediately, jumpstarting production volumes and further decreasing costs.

For photovoltaics, we are calling for a tax incentive of $3.00 / Watt for systems below 10 kW, and $2.00 / Watt above that, decreasing at 5% per year. For solar hot water, we would request a smaller incentive - $15.00 per thousand Btu / day performance rating, declining by $1 per year.

Finally, for concentrating solar power plants, which would not qualify for either of these credits, we ask that they be allowed to use the wind production tax credit, without additional restrictions.

We have calculated that these incentives would make solar the *economic choice* for millions of Americans in every part of the country, even as it declined in value from year to year. The US would once again become the global leader in the next great high-tech industry – solar energy. To give you an idea of future growth:

- Ten years from now, the solar energy industry will create more than 60,000 new US jobs, and over $34 billion in new investments, in all 50 states.

- Solar energy will displace 6.3 trillion cubic feet of natural gas over 20 years, saving consumers $64 billion.

- By 2025, solar will provide half of all new annual electricity generation.

- By 2030, installed solar output capacity will equal the equivalent of more than 40 nuclear power plants, supporting 260,000 high quality domestic jobs in manufacturing, engineering, and construction.

We face a decision point. The next 10 years are critical, for worldwide solar power development, for our nation's energy security, and for our manufacturing growth.

Conclusion: Fulfilling the President's Priorities

In conclusion, I would note that the Administration has identified four priorities for the US economy - security, opportunity, innovation, and ownership. I would submit that our technologies are uniquely suited to advance all of these objectives.

We contribute to security by reducing the degree to which we depend on foreign governments to drive our economy.

We provide opportunity by generating thousands of jobs nationwide, in an industry that I am confident will be one of the world's fastest growing for years to come.

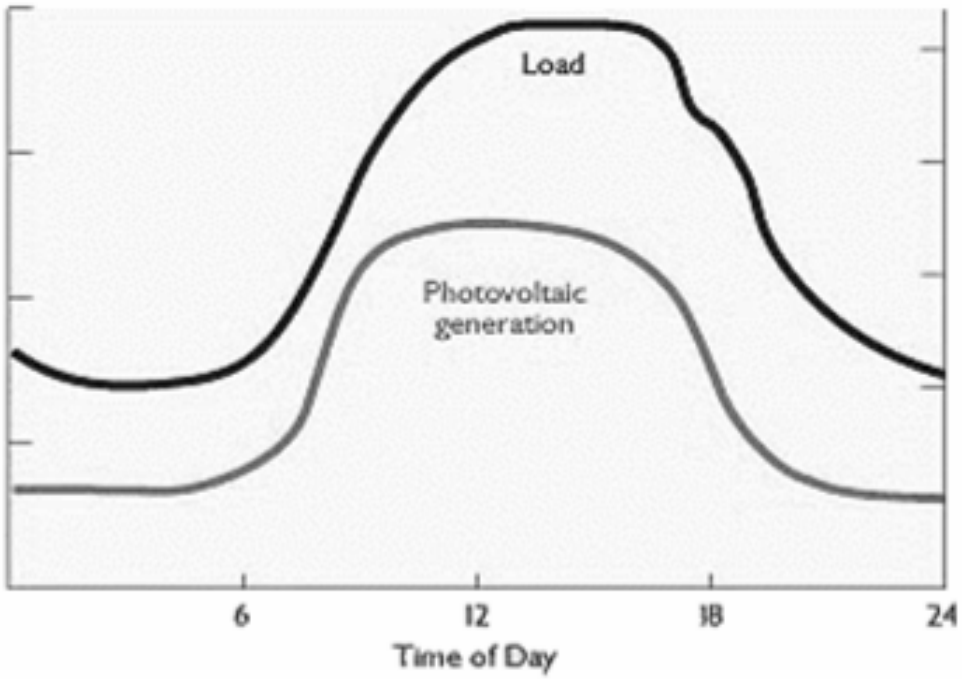
We produce – and demand – innovation, by pushing performance in a 21st century technology even as we scale up to meet today's demands.

Almost uniquely, we provide ownership. With a solar system, you have the freedom to own your electricity, rather than renting it at whatever price a utility or marketer sets.

I urge the committee to advance our national interest and our economic future by advancing aggressive and carefully designed policies for the promotion of solar energy. We are ready at any time to provide any assistance you may require.

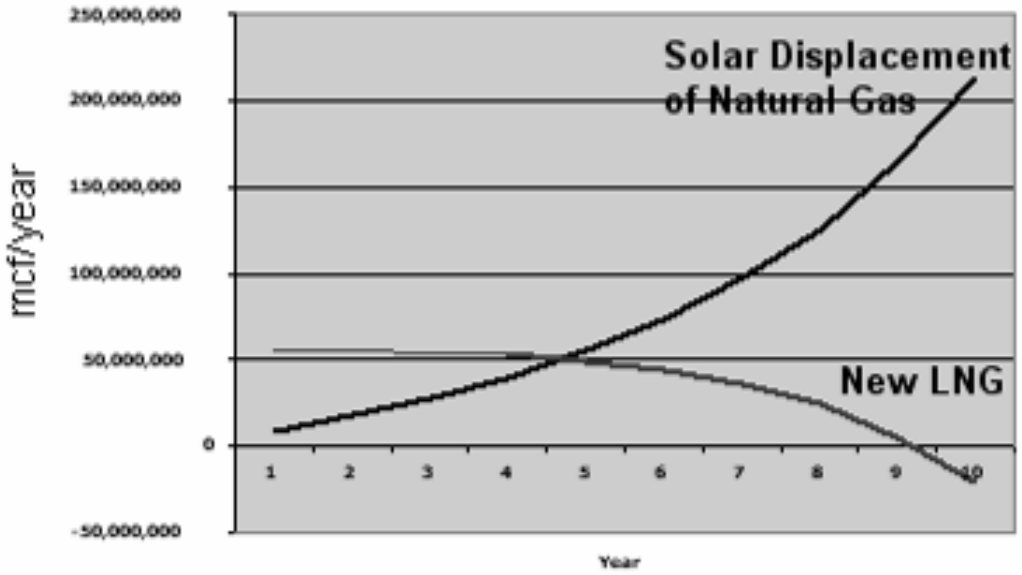
This concludes my testimony. Thank you.

Attachment 1 - Solar Addresses Peak Load



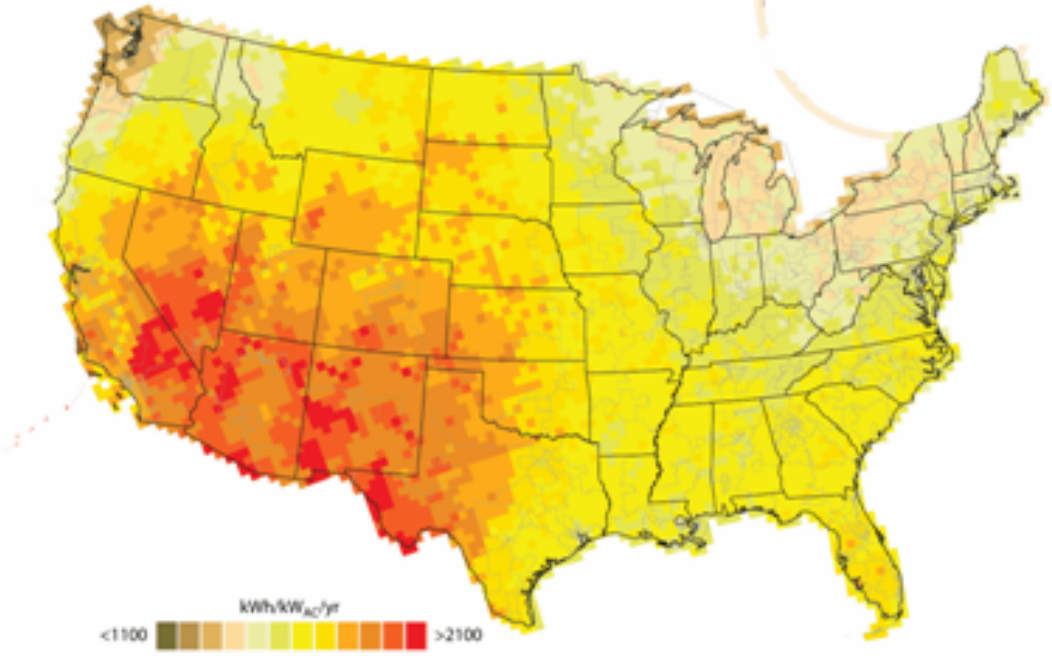
http://www.nrel.gov/ncpv/documents/pv_rtbl.html

Attachment 2 – Solar Could Significantly Displace Gas Demand



Source : EIA AEO 2005, PV Roadmap Projections

Attachment 3 – Superior Solar Resources Serve the Whole Nation



Source : PV Roadmap

Attachment 4 – Sustained Policies Develop Thousands of Jobs